

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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# PCT

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year)	29 APR 2005
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Applicant's or agent's file reference  CL2125PCT		FOR FURTHER ACTION See paragraph 2 below	
International application No.	International filing date (day/month/year)	Priority date (day/month/year)	
PCT/US04/10710	07 April 2004 (07.04.2004)	07 April 2003 (07.04.2003)	
International Patent Classification (IPC) or both national classification and IPC  IPC(7): G06K 9/00; G01N 21/00, 21/84 and US Cl.: 382/141; 356/435, 429			
Applicant  E. I. DU PONT DE NEMOURS AND COMPANY			

**1. This opinion contains indications relating to the following items:**

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input checked="" type="checkbox"/> | Box No. VII  | Certain defects in the international application   |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application  |

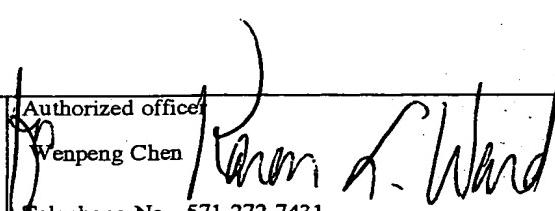
**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA/ US  Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450  Facsimile No. (703)305-3230	Authorized office:  Wenpeng Chen Telephone No. 571 272-7431
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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US04/10710

10/549781

Box No. I Basis of this opinion

10/549781 Doc'd OCT/PTO 19 SEP 2005

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

a sequence listing

table(s) related to the sequence listing

b. format of material

in written format

in computer readable form

c. time of filing/furnishing

contained in international application as filed.

filed together with the international application in computer readable form.

furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
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**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Industrial applicability (IA)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and explanations:**

Please See Continuation Sheet

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

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**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

The drawings are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof: Fig. 8A shows "from Fig. 7 point A". However, there is no point A in Fig. 7.

The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof: the title of the abstract does not match with that of the specification.

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International application No.

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**10/549781****Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

1. Claims 1-12 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims 1-12 are indefinite for the following reason(s).

There is insufficient antecedent basis for the following limitation(s) in each claim:

-- Claim 1 recites "the ratios" in line 13. It seems to the Examiner that the problem can be fixed by changing "ratio" in line 11 to "ratios".

-- Claim 2 recites "the illumination level" in line 19. It shall be changed to "the illumination output level".

2. Claim 1 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 1 is indefinite for the following reason(s).

Claim 1 recites "an illumination level the same as that .." in line 9. The level can be referred to the initial illumination level or the adjusted illumination level.

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International application No.  
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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

**V. 2. Citations and Explanations:**

1. Claims 1-18 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the method of Claims 1-2 and the apparatus of Claim 13.

a. For Claim 1, The prior fails to teach the method for measuring the degree to which a printed image on a first side of a sheet is visible when illuminating and viewing a second side of the sheet, the method specifically comprising:

- creating a calibration image of a reference object containing no image by illuminating the reference object at an adjusted illumination level;
- illuminating the sheet at an illumination level the same as that used to create the calibration image and creating an image of the sheet;
- measuring the ratios of the pixel intensities of the image of the sheet with the corresponding pixel intensities of the calibration image;
- calculating a mean value of the ratios of the pixel intensities.

b. For Claim 2, The prior fails to teach the image analysis method for characterizing the showthrough of a printed image on the reverse surface of a substantially planar sample object having a reflective front surface, by measuring the optical reflectance of the front surface with a lens and a photodetector array, the method specifically comprising:

- (a) creating a frame-averaged dark current image representing the response of the photodetector array in the absence of light;
- (b) uniformly illuminating, with a diffuse light source, the front surface of a reference object, said reference object having no image on its reverse, and creating a calibration image of the reference object, comprising the steps of:
  - (5) creating a frame-averaged reference image of the front surface of the reference object;
  - (6) creating a dark-current corrected calibration image of the reference object by subtracting the frame-averaged dark current image of step (a) from the frame-averaged reference image of step (5) on a pixel by pixel basis and storing the resulting image in the memory;
- (c) creating a dark-current-corrected image of the front surface of the sample object by subtracting the frame-averaged dark current image of step (a) from the frame-averaged image of step (d) on a pixel by pixel basis and storing the resulting image in the memory;
- (f) analyzing the dark-current-corrected frame-averaged image by calculating the ratio of the image of step (e) with the image of step (b) (6) on a pixel by pixel basis to quantify showthrough.

c. For Claim 13, the prior fails to teach the apparatus for measuring the degree to which a printed image on a first side of a substantially planar sample object is visible when illuminating and viewing a second side of the substantially planar sample object, the apparatus specifically comprising:

- a) a light tight enclosure comprising a sample object holder, an illuminating assembly for diffusely illuminating the sample

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

object, and an imaging assembly,

b) a computerized image processing assembly for controlling the illumination level of the sample object created by the illuminating assembly and for receiving images created by the imaging assembly and analyzing those images, wherein

-- the illuminating assembly comprises:

(i) a hemispherical reflector positioned adjacent the sample holder so that the predetermined sample plane corresponds to the equatorial plane of the hemisphere, the hemisphere having a diffusely reflecting interior surface and a polar opening for mounting the imaging assembly,

(ii) a circular array of light sources positioned above the equatorial plane and arranged to illuminate the diffusely reflecting interior surface of the hemisphere;

(iii) a photodetector positioned adjacent the array of light sources and oriented to sense the level of light diffusely reflected from the interior surface of the hemisphere;

-- the imaging assembly comprising:

(i) a photodetector array, the lens focusing an image of the object onto the photodetector array, each photodetector in the array creating an electrical signal representative of the light reflected from the front surface of the object, the photodetector array being connected to the computerized image processing assembly.

2. Claims 1-18 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.